Interdisciplinary Master of Science Program in Regenerative Medicine

Grant Award Details

Interdisciplinary Master of Science Program in Regenerative Medicine

Grant Type: Bridges II

Grant Number: EDUC2-08388

Investigator:

Name:	Trevor Cardinal
Institution:	California Polytechnic State University, San Luis Obispo
Type:	PI

Award Value: $2,632,378

Status: Active

Grant Application Details

Application Title: Interdisciplinary Master of Science Program in Regenerative Medicine

Public Abstract:

Our proposed (and existing) training program is an interdisciplinary Specialization in Regenerative Medicine, offered within the master of science (M.S.) degrees of three different departments from three academic units (colleges). The goal of our M.S. program is to graduate 10 day-one ready professionals per year capable of advancing CIRM's mission of accelerating stem cell treatments to patients with unmet clinical needs. The first step in achieving this goal is a year of coursework and project experience at our institution, which prepares students to maximize the educational value of their internship by training them to:
1) perform fundamental laboratory procedures involved in regenerative medicine research & development (including cell culture, cell transplantation, microscopy, and molecular biology)
2) discuss and critically evaluate biomedical primary literature
3) effectively communicate technical topics to both peer and lay audiences
4) explain the process of biotechnology development & commercialization
5) describe how research & development efforts are motivated by and impact physician & patient experiences
6) design and execute independent research projects.
It is important to note that the third learning objective above will involve community outreach with schools, partner community colleges, and the general community, while learning objectives four and five will involve in-person patient engagement, and training in product development and regulatory pathways for biologic therapies. Achieving these learning objectives, along with a 7-day immersive training course in pluripotent stem cell culture techniques, will allow students to more effectively advance product development and translational research during their 9-month internship at commercial or academic institutions, respectively. Further facilitating their internship effectiveness will be the full-time nature of their effort, with no coursework other than the Internship Course, students will be able to focus exclusively on their project. The results of our past students' internship projects have been included in journal publication, conference presentation, patent applications, and regulatory approval documents filed with the FDA. These outcomes clearly demonstrate that through their internship projects and post-graduate activities, our students have, and with the receipt of this award would continue, to contribute to CIRM's mission of accelerating stem cell treatments to patients with unmet clinical needs during their internship and in their post-graduate career.

Statement of Benefit to California:

This program will benefit California in two main ways. First, and with regard to the direct involvement in accelerating stem cell treatments to patients with unmet needs, our pre-internship curriculum will prepare students to use their internship experience to advance both translational research and product development, accelerating the identification of new therapeutic targets/strategies and accelerating the movement of therapeutic products into the market. Also in this regard, our graduates will strengthen the California economy and ultimately improve patient health by boosting the biotechnology workforce with day-one ready professionals, ready to advance the burgeoning biotechnology area of cell-based treatments. Second, our community outreach activities will help build a diverse human-capital 'pipeline' by motivating students in secondary school and community colleges to pursue advanced degrees in the regenerative medicine field. These outreach activities will also develop awareness, support, and enthusiasm among the general public for regenerative medicine solutions.
Graduates of our program have impacted a number of fields, by performing fundamental and translational research in both academic laboratories (as research associates and doctoral students) and for-profit companies, developing and manufacturing regenerative medicine products at for-profit companies, and participating in clinical-trial organization at large medical centers. Additionally, our graduates who are employed at for-profit companies in the medical device sector are indirectly benefiting the field by providing their regenerative medicine perspective to traditional device design and development. We expect similar impacts by the graduates of the proposed program.